WHAT IS CLAIMED IS:

1. A method of encoding data for transmission from a source to a destination over a communications channel, the method comprising:

generating a plurality of redundant symbols from an ordered set of input symbols to be transmitted; and

generating a plurality of output symbols from a combined set of symbols including the input symbols and the redundant symbols, wherein the number of possible output symbols is much larger than the number of symbols in the combined set of symbols, wherein at least one output symbol is generated from more than one symbol in the combined set of symbols and from less than all of the symbols in the combined set of symbols, such that the ordered set of input symbols can be regenerated to a desired degree of accuracy from any predetermined number, N, of the output symbols.

2. The method of claim 1, further comprising transmitting the plurality of output symbols over a communications channel.

3. The method of claim 1, further comprising storing the plurality of output symbols on a storage media.

4. The method of claim 1, wherein N is greater than the number of input symbols in the ordered set of input symbols.

5. The method of claim 1, wherein N is less than or equal to the number of input symbols in the ordered set of input symbols.

6. The method of claim 1, further comprising determining a number R of redundant symbols to generate based on the number K of input symbols in the ordered set of input symbols.

7. The method of claim 6, wherein K is an estimate of the number of input symbols.

8. The method of claim 1, wherein the plurality of redundant symbols is generated according to a LDPC code.

9. The method of claim 1, wherein the plurality of redundant symbols includes a plurality of first redundant symbols and a plurality of second redundant symbols, and wherein the step of generating the plurality of redundant symbols comprises:

generating the plurality of first redundant symbols from the input symbols; and

generating the plurality of second redundant symbols from the first redundant symbols and the input symbols.

10. The method of claim 9, wherein the plurality of first redundant symbols is generated according to a Hamming code, and wherein the plurality of second redundant symbols is generated according to a LDPC code.

11. The method of claim 10, further comprising:

determining a number D+1 of first redundant symbols based on the number K of input symbols in the ordered set of input symbols; and

determining a number E of second redundant symbols based on a number R of redundant symbols to generate and D+1.

12. The method of claim 11, further comprising determining R based on K.

13. The method of claim 11, wherein K is an estimate of the number of input symbols.

14. The method of claim 11, wherein D is a smallest integer such that $2D - D - 1 >= K$, and wherein $E = R - D - 1$.

15. The method of claim 1, wherein the desired accuracy is complete recovery of the input symbols.

16. The method of claim 1, wherein the desired accuracy is complete recovery of the input symbols with a high probability.

17. The method of claim 1, wherein the desired accuracy is recovery of G input symbols, wherein G is less than the number of input symbols in the ordered set of input symbols.

18. The method of claim 1, wherein at most G input symbols can be regenerated from any number of output symbols, wherein G is less than the number of input symbols in the ordered set of input symbols.

19. The method of claim 1, wherein generating a plurality of redundant symbols includes, for each redundant symbol:

determining t distinct input symbols according to a distribution; and

computing each redundant symbol as the XOR of the t distinct input symbols.

20. The method of claim 19, wherein t is the same for all redundant symbols.

21. The method of claim 20, wherein t is the smallest odd integer larger than K/2, wherein K is the number of input symbols in the ordered set of input symbols.

22. The method of claim 19, wherein the distribution is a uniform distribution.

23. The method of claim 1, further comprising transmitting the plurality of output symbols over a communications channel, wherein the step of generating the plurality of output symbols is performed substantially concurrently with the step of transmitting the plurality of output symbols.

24. The method of claim 23, wherein the step of generating the plurality of redundant symbols is performed substantially concurrently with the step of transmitting the plurality of output symbols.

25. The method of claim 23, wherein the step of generating the plurality of redundant symbols is performed in advance of the step of transmitting the plurality of output symbols.

26. The method of claim 1, wherein the step of generating the plurality of output symbols is performed using a first device, and wherein the step of generating the plurality of redundant symbols is performed using a second device separate from the first device.

27. A system for encoding data for transmission from a source to a destination over a communications channel, the system comprising:

a static encoder coupled to receive a plurality of input symbols, the plurality of input symbols generated from data to be transmitted, the static encoder including a redundant symbol generator that generates a plurality of redundant symbols based on the input symbols; and

a dynamic encoder coupled to receive the plurality of input symbols and the plurality of redundant symbols, the dynamic encoder including an output symbol generator that generates a plurality of output symbols from a combined set of symbols including the plurality of input symbols and the plurality of redundant symbols, wherein the number of possible output symbols is much larger than the number of symbols in the combined set, wherein at least one output symbol is generated from more than symbol from the combined set and from less than all of the symbols in the combined set, such that the ordered set of input symbols can be regenerated to a desired degree of accuracy from any predetermined number, N, of the output symbols.

28. The system of claim 27, wherein N is greater than the number of input symbols in the ordered set of input symbols.

29. The system of claim 27, wherein N is less than or equal to the number of input symbols in the ordered set of input symbols.

30. The system of claim 27, further comprising a transmit module, coupled to the dynamic encoder and to a communications channel, that receives the output symbols and transmits the output symbols over the communications channel.

31. The system of claim 27, further comprising a key generator, coupled to the dynamic encoder, that generates a key for each output symbol to be generated, wherein the dynamic encoder is coupled to receive each key, and wherein the dynamic encoder generates each output symbol based on the corresponding key.

32. The system of claim 27, further comprising a key generator, coupled to the static encoder, that generates a key for each of at least some of the redundant symbols to be generated, wherein the static encoder is coupled to receive each key, and wherein the static

encoder generates each of the at least some redundant symbols based on the corresponding key.

33. The system of claim 27, wherein the static encoder includes a LDPC encoder.

34. The system of claim 27, wherein the static encoder further comprises a first static encoder having a first redundant symbol generator, and a second static encoder having a second redundant symbol generator;

wherein the plurality of redundant symbols includes a first plurality of redundant symbols and a

a second plurality of redundant symbols;

wherein the first redundant symbol generator generates the first plurality of redundant symbols based on the input symbols; and

wherein the second redundant symbol generator generates the second plurality of redundant symbols based on the input symbols and the first plurality of redundant symbols.

35. The system of claim 34, wherein the first static encoder includes a Hamming encoder, and wherein the second static encoder includes a LDPC encoder.

36. A method of receiving data transmitted from a source over a communications channel, the method comprising:

receiving output symbols, wherein each output symbol is generated from at least one symbol in a combined set of input symbols and redundant symbols, wherein at least one output symbol is generated from more than one symbol in the combined set and less than all of the symbols in the combined set, wherein the number of possible output symbols is much larger than the number of symbols in the combined set, wherein the input symbols are from an ordered set of input symbols, wherein the redundant symbols are generated from the input symbols;

upon receiving at least a subset of the output symbols, regenerating at least a subset of the symbols in the combined set from the output symbols, the subset of the symbols in the combined set including a plurality of regenerated input symbols and a plurality of regenerated redundant symbols;

if the step of regenerating at least a subset of the symbols from the N output symbols does not regenerate the input symbols to a desired degree of accuracy, regenerating at least some of unregenerated input symbols from the plurality of regenerated redundant symbols and the plurality of regenerated input symbols.

37. The method of claim 36, wherein the redundant symbols include a first plurality of redundant symbols and a second plurality of redundant symbols, wherein the step of regenerating at least some of the unregenerated input symbols includes:

regenerating, from the regenerated redundant symbols of the first plurality of redundant symbols and the plurality of regenerated input symbols, at least one of the unregenerated input symbols and unregenerated redundant symbols of the second plurality of redundant symbols; and

if the step of regenerating from the regenerated redundant symbols of the first plurality of redundant symbols and the plurality of regenerated input symbols does not regenerate the input symbols to a desired degree of accuracy, regenerating at least one unregenerated input symbol from redundant symbols of the second plurality of redundant symbols and the plurality of decoded input symbols.

38. The method of claim 37, wherein some of the unregenerated input symbols and unregenerated redundant symbols of the second plurality of redundant symbols is regenerated using an LDPC decoder; and

wherein the some input symbol is regenerated from redundant symbols of the second plurality of redundant symbols using a Hamming decoder.

39. The method of claim 36, wherein the step of regenerating at least some of unregenerated input symbols includes regenerating all of the unregenerated input symbols.

40. The method of claim 36, wherein the step of regenerating at least the subset of the symbols in the combined set and the step of regenerating at least some of unregenerated input symbols include:

forming a first matrix that indicates, for each received output symbol, the symbols in the combined set associated with the output symbol;

augmenting the first matrix with information that indicates, for each redundant symbol, the input symbols associated with the redundant symbol; and

regenerating at least some of the input symbols as a solution to a system of equations indicated by the augmented first matrix.

41. The method of claim 36, wherein N is greater than or equal to the number of input symbols.

42. The method of claim 36, wherein N is smaller than the number of input symbols.

43. The method of claim 36, wherein regenerating at least some of unregenerated input symbols includes regenerating all of the input symbols.

44. The method of claim 36, wherein regenerating at least some of unregenerated input symbols includes regenerating less than all of the input symbols.

45. A system for receiving data transmitted from a source over a communications channel, the system comprising:

a receive module coupled to a communications channel for receiving output symbols transmitted over the communications channel, wherein each output symbol is generated from at least one symbol in a combined set of input symbols and redundant symbols, wherein at least one output symbol is generated from more than one symbol in the combined set and less than all of the symbols in the combined set, wherein the number of possible output symbols is much larger than the number of symbols in the combined set, wherein the input symbols are from an ordered set of input symbols, wherein the redundant symbols are generated from the input symbols;

a dynamic decoder that, upon receiving at leas a subset of the output symbols, decodes a subset of the symbols in the combined set from the output symbols, the subset of the symbols in the combined set including a plurality of decoded input symbols and a plurality of decoded redundant symbols; and

a static decoder that decodes at least some of undecoded input symbols, if any, from the plurality of decoded redundant symbols.

46. The system of claim 45, wherein the static decoder includes a LDPC decoder.

47. The system of claim 45, wherein the redundant symbols include a first plurality of redundant symbols and a second plurality of redundant symbols, wherein the static encoder includes:

a first static decoder that decodes, from the decoded redundant symbols of the first plurality of redundant symbols and the plurality of decoded input symbols, at least one of the undecoded input symbols and undecoded redundant symbols of the second plurality of redundant symbols; and

a second static decoder that decodes at least one undecoded input symbol from redundant symbols of the second plurality of redundant symbols and the plurality of decoded input symbols.

48. The system of claim 47, wherein the first static decoder includes a LDPC decoder, and wherein the second static decoder includes a Hamming decoder.

49. The system of claim 45, wherein the dynamic decoder includes a processor configured to perform the steps of:

forming a first matrix that indicates, for each received output symbol, the symbols in the combined set associated with the output symbol;

augmenting the first matrix with information that indicates, for each redundant symbol, the input symbols associated with the redundant symbol; and

regenerating at least some of the input symbols as a solution to a system of equations indicated by the augmented first matrix.

50. A computer data signal embodied in a carrier wave comprising:

a plurality of output symbols, wherein the plurality of output symbols represents symbols generated from a combined set of symbols including an ordered set of input symbols and the redundant symbols, wherein the redundant symbols are generated from the input symbols, wherein the number of possible output symbols is much larger than the number of symbols in the combined set of symbols, wherein at least one output symbol is generated from more than one symbol in the combined set of symbols and from less than all of the symbols in the combined set of symbols;

such that a receiver of the data signal can regenerate the ordered set of input symbols to a desired degree of accuracy from any predetermined number, N, of the output symbols.

51. The method of claim 36, wherein the step of regenerating at least a subset of the symbols is performed upon receiving a predetermined number N of any of the output symbols.

52. The method of claim 36, wherein the step of regenerating at least a subset of the symbols is performed upon receiving a number N of any of the output symbols, wherein N is such that the input symbols can be regenerated to a desired accuracy.

53. The method of claim 36, wherein the step of regenerating at least a subset of the symbols is performed substantially concurrently with receiving the output symbols.